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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/758,689 | 01/15/2004 | Arvind Raman | 1864.004US1 | 4967 |

40317 7590 12/23/2008

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| EXAMINER | |
|---|---|
| RAO, ANAND SHASHIKANT | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2621 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 12/23/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/758,689 | RAMAN ET AL. | |
| | Examiner | Art Unit | |
| | Andy S. Rao | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12/5/08*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3-13 and 15-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13 and 15-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/5/08 has been entered.

2. Applicant's arguments with respect to claims 1, 3-13, 15-31 as filed on 12/5/08 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 101*

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1, 3-13, 15-16 are rejected under 35 U.S.C. 101 as not falling within one of four statutory categories of inventions. Supreme Court precedent and recent Federal Circuit decisions indicate a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example there is no apparatus mentioned either in the preamble nor in the subsequent limitations for executing all of the steps of the method (a video

camera is recited, but it is only a component for executing the method), nor can the determination of a buffer size be considered a transformation of an article or material, *In re Bilski, 88 USPQ2d 1385 (Fed. Cir. 2008).*

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3-13, and 16-31 are rejected under 35 U.S.C. 102(a) as being unpatentable over Katsavounidis et al., (hereinafter referred to as "Katsavounidis") in view of Chien et al., (hereinafter referred to as "Chien").

Katsavounidis discloses a method (Katsavounidis: figure 3) comprising: detecting a channel error by locating a damaged macroblock in multiple macroblocks of a video frame using header information (Katsavounidis: column 8, lines 15-20); and isolating the detected channel error to a few macroblocks around the located damaged macroblock to reduce data loss and improve video quality (Katsavounidis: column 8, lines 25-37), as in claim 1. However, Katsavounidis fails to disclose wherein isolating the detected channel error comprises: estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame; and replacing the damaged macroblock with the estimated damaged macroblock to conceal the error in the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the steps of

estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53; column 4, lines 20-35); and replacing the damaged macroblock with the estimated damaged macroblock to conceal the error in the damaged macroblock (Chien: column 5, lines 20-40; column 6, lines 65-67; column 7, lines 1-18) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment steps into the Katsavounidis method in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis method, now incorporating the Chien error concealment steps, has all of the features of claim 1.

Regarding claim 3, the Katsavounidis method, now incorporating the Chien error concealment steps, has discloses receiving a coded video signal (Katsavounidis: column 8, lines 15-25); and parsing the coded video signal to obtain a sequence of video frames (Katsavounidis: column 6, lines 45-65); and parsing each video frame to obtain the header information, video packet information, and macroblock data, wherein the macroblock data includes multiple macroblocks (Katsavounidis: column 7, lines 20-35), as in the claim

Regarding claim 4, Katsavounidis discloses wherein estimating the damaged macroblock using the undamaged macroblocks substantially surrounding the boundary of the damaged macroblock comprises: estimating the damaged macroblock by using a weighted linear interpolation of the undamaged macroblocks surrounding the damaged macroblock (Chien: column 9, lines 40-60), as in the claim.

Regarding claim 5, Katsavounidis discloses wherein estimating the damaged macroblock using the undamaged macroblocks comprises: computing a pixel value for each pixel in the damaged macroblock as a function of associated pixels in the undamaged macroblocks substantially surrounding the boundary of the damaged macroblock (Chien: column 9, lines 40-60), as in the claim.

Katsavounidis discloses a method (Katsavounidis: figure 3) comprising: detecting an error by locating a damaged macroblock in multiple macroblocks in a video frame using header information, global information, and/or video packet information in the video frame (Katsavounidis: column 8, lines 10-20); estimating a pixel value for each pixel in the damaged macroblock by computing a weighted sum of the associated pixel values in macroblocks adjacent to the damaged macroblock (Katsavounidis: column 9, lines 1-22); and copying the estimated damaged macroblock to conceal the error in the damaged macroblock (Katsavounidis: column 8, lines 40-50), as in claim 6. However, Katsavounidis fails to implement the estimation step using all the macroblocks surrounding the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the step of estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53; column 4, lines 20-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment steps into the Katsavounidis method in order to implement error concealment

on blocks exhibiting a high motion content. The Katsavounidis method, now incorporating the Chien error concealment steps, has all of the features of claim 6.

Regarding claim 7, the Katsavounidis method, now incorporating the Chien error concealment steps, discloses wherein, in estimating, the undamaged macroblocks surrounding the damaged macroblock comprises about 1- 4 undamaged macroblocks (Katsavounidis: column 8, lines 50-60), as in the claim.

Regarding claim 8, the Katsavounidis method, now incorporating the Chien error concealment steps, that the computed weight of each associated pixel is inversely proportional to the distance between a pixel being estimated and a pixel being used for estimation (Katsavounidis: column 9, lines 1-21), as in the claim.

Regarding claim 10, the Katsavounidis method, now incorporating the Chien error concealment steps, wherein the header information includes information selected from the group consisting of a frame start code, header information, and a stuffing bit pattern (Katsavounidis: column 23, lines 3-65).

Regarding claim 11, the Katsavounidis method, now incorporating the Chien error concealment steps, wherein the video packet information includes information selected from the group consisting of resync marker data, a macroblock number, and motion and header information (Katsavounidis: column 24, lines 45-62), as in the claim.

Katsavounidis discloses a method (Katsavounidis: figure 3) comprising: detecting a channel error by locating a damaged macroblock in multiple macroblocks in a current video frame using header information, global information, and/or video packet information in the video frame (Katsavounidis: column 8, lines 10-20); reconstructing the damaged macroblock by

estimating a motion vector of the damaged macroblock using motion vectors of undamaged macroblocks surrounding the damaged macroblock (Katsavounidis: column 10, lines 30-65); and copying the reconstructed damaged macroblock to conceal the error in the damaged macroblock (Katsavounidis: column 8, lines 50-60), as in claim 12. However, Katsavounidis fails to disclose wherein reconstruction of the damaged macroblock by estimating the motion vector of damaged macroblock using motion vectors of the undamaged macroblocks surrounding the damaged macroblock comprises: estimating the motion vector of the damaged macroblock in the current video frame; estimating a motion vector of a macroblock located substantially adjacent and above the damaged macroblock; estimating a motion vector of a macroblock located substantially below the damaged macroblock; estimating a motion vector of a macroblock located substantially adjacent, above, and left of the damaged macroblock; checking for error in the macroblock located substantially below the damaged macroblock; and if there is an error in the macroblock located substantially below the damaged macroblock, then estimating the motion vector of the damaged macroblock as the motion vector of the macroblock located substantially adjacent and above the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the steps of estimating the motion vector of damaged macroblock using motion vectors of the undamaged macroblocks surrounding the damaged macroblock (Chien: figure 3) comprises: estimating the motion vector of the damaged macroblock in the current video frame (Chien: column 3, lines 60-67); estimating a motion vector of a macroblock located substantially adjacent and above the damaged macroblock; estimating a motion vector of a macroblock located substantially below the damaged macroblock (Chien: column 4, lines 1-7); estimating a motion vector of a macroblock located substantially

adjacent, above, and left of the damaged macroblock; checking for error in the macroblock located substantially below the damaged macroblock (Chien: column 4, lines 8-13); and if there is an error in the macroblock located substantially below the damaged macroblock, then estimating the motion vector of the damaged macroblock as the motion vector of the macroblock located substantially adjacent and above the damaged macroblock (Chien: column 4, lines 14-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment steps into the Katsavounidis method in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis method, now incorporating the Chien error concealment steps, has all of the features of claim 12.

Regarding claim 13, the Katsavounidis method, now incorporating the Chien error concealment steps, discloses wherein using the motion vectors of the undamaged macroblocks surrounding the damaged macroblock comprises: using the motion vectors of undamaged macroblocks located in two rows that are substantially adjacent to the damaged macroblock (Katsavounidis: column 4, lines 20-25)), as in the claim.

Regarding claim 16, the Katsavounidis method, now incorporating the Chien error concealment steps, discloses wherein, in estimating, the macroblock located substantially below the damaged macroblock comprises a macroblock located about two rows below the damaged macroblock (Chien: column 7, lines 60-67; column 8, lines 1-30), as in the claim.

Katsavounidis discloses an apparatus (Katsavounidis: figure 1) comprising: a header decoding module parses a video frame to get header information and multiple macroblocks

(Katsavounidis: column 7, lines 5-15); an error recovery module detects a channel error by locating a damaged macroblock in the multiple macroblocks using the header information (Katsavounidis: column 8, lines 15-20); and a spatial data error concealment module estimates the damaged macroblock by using undamaged macroblocks adjacent to the boundary of the damaged macroblock and replaces the damaged macroblock with the estimated damaged macroblock to conceal the channel error in the damaged macroblock (Katsavounidis: column 8,lines 40-60), as in claim 17. However, Katsavounidis fails to disclose an error concealment module using all the macroblocks substantially surrounding the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the step of estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53; column 4, lines 20-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment module into the Katsavounidis apparatus in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis apparatus, now incorporating the Chien error concealment module, has all of the features of claim 17.

Regarding claim 18, the Katsavounidis apparatus, now incorporating the Chien error concealment module, discloses a bit stream demux module receives a coded video signal and obtains a sequence of video frames (Katsavounidis: column 6, lines 45-65), as in the claim.

Regarding claim 19, the Katsavounidis apparatus, now incorporating the Chien error concealment module, discloses the spatial data error concealment module estimates the damaged macroblock by using a weighted linear interpolation of the undamaged macroblocks surrounding the damaged macroblock. (Chien: column 9, lines 40-65), as in the claim.

Regarding claim 20, the Katsavounidis apparatus, now incorporating the Chien error concealment module, discloses wherein the spatial data error concealment module estimates the damaged macroblock by computing a pixel value for each pixel in the damaged macroblock as a function of associated pixels in the undamaged macroblocks surrounding the damaged macroblock (Chien: column 5, lines 20-45), as in the claim.

Katsavounidis discloses a video decoder (Katsavounidis: figure 1) comprising: a header decoding module parses a video frame to get header information and multiple macroblocks (Katsavounidis: column 7, lines 5-15); an error recovery module detects a channel error by locating a damaged macroblock in the multiple macroblocks using the header information (Katsavounidis: column 8, lines 15-20); and a spatial data error concealment module estimates the damaged macroblock by using undamaged macroblocks adjacent to the boundary of the damaged macroblock and replaces the damaged macroblock with the estimated damaged macroblock to conceal the channel error in the damaged macroblock (Katsavounidis: column 8,lines 40-60), as in claim 21. However, Katsavounidis fails to disclose an error concealment module using all the macroblocks substantially surrounding the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the step of estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53;

column 4, lines 20-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment module into the Katsavounidis decoding apparatus in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis decoding apparatus, now incorporating the Chien error concealment module, has all of the features of claim 21.

Regarding claim 22, the Katsavounidis decoding apparatus, now incorporating the Chien error concealment module, has discloses wherein the undamaged macroblocks surrounding the damaged macroblock comprises about 1-4 undamaged macroblocks substantially surrounding the damaged macroblock (Katsavounidis: column 8, lines 40-60), as in the claim.

Regarding claim 23, the Katsavounidis decoding apparatus, now incorporating the Chien error concealment module, has wherein the computed weight of each associated pixel is inversely proportional to the distance between an estimated pixel and a pixel being used for estimation (Chien: column 8, lines 35-67), as in the claim.

Katsavounidis discloses an apparatus for decoding a coded video signal (Katsavounidis: figure 1) comprising: a header decoding module parses a video frame to get header information and multiple macroblocks (Katsavounidis: column 24, lines 45-55); an error recovery module detects a channel error by locating a damaged macroblock in the multiple macroblocks using the header information, global information, and/or video packet information in the video frame (Katsavounidis: column 8, lines 15-20); a spatial data error concealment module obtains motion vectors of undamaged macroblocks adjacent to the damaged macroblock (Katsavounidis: column

8, lines 40-50), wherein the spatial error concealment module estimates a motion vector of the damaged macroblock using the motion vectors of undamaged macroblocks (Katsavounidis: column 10, lines 45-55), wherein the spatial data error concealment module reconstructs the damaged macroblock using the estimated damaged macroblock (Katsavounidis: column 9, liens 35-45); and copying the reconstructed damaged macroblock to conceal the error in the damaged macroblock (Katsavounidis: column 8, lines 40-55), as in claim 24. Katsavounidis fails to disclose wherein reconstruction of the damaged macroblock by estimating the motion vector of damaged macroblock using motion vectors of the undamaged macroblocks surrounding the damaged macroblock comprises: estimating the motion vector of the damaged macroblock in the current video frame; estimating a motion vector of a macroblock located substantially adjacent and above the damaged macroblock; estimating a motion vector of a macroblock located substantially below the damaged macroblock; estimating a motion vector of a macroblock located substantially adjacent, above, and left of the damaged macroblock; checking for error in the macroblock located substantially below the damaged macroblock; and if there is an error in the macroblock located substantially below the damaged macroblock, then estimating the motion vector of the damaged macroblock as the motion vector of the macroblock located substantially adjacent and above the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the steps of estimating the motion vector of damaged macroblock using motion vectors of the undamaged macroblocks surrounding the damaged macroblock (Chien: figure 3) comprises: estimating the motion vector of the damaged macroblock in the current video frame (Chien: column 3, lines 60-67); estimating a motion vector of a macroblock located substantially adjacent and above the damaged macroblock;

estimating a motion vector of a macroblock located substantially below the damaged macroblock (Chien: column 4, lines 1-7); estimating a motion vector of a macroblock located substantially adjacent, above, and left of the damaged macroblock; checking for error in the macroblock located substantially below the damaged macroblock (Chien: column 4, lines 8-13); and if there is an error in the macroblock located substantially below the damaged macroblock, then estimating the motion vector of the damaged macroblock as the motion vector of the macroblock located substantially adjacent and above the damaged macroblock (Chien: column 4, lines 14-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment module into the Katsavounidis decoding apparatus in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis decoding apparatus, now incorporating the Chien error concealment module, has all of the features of claim 24.

Regarding claim 25, the Katsavounidis decoding apparatus, now incorporating the Chien error concealment module, discloses wherein the spatial data error concealment module estimates the motion vector of the damaged macroblock using the motion vectors of the undamaged macroblocks located in about two rows that are substantially adjacent to the damaged macroblock (Chien: column 4, lines 20-30), as in the claim.

Katsavounidis discloses an article (Katsavounidis: column 6, lines 15-25) comprising: a storage medium having instructions that, when executed by a computing platform, result in execution of a method (Katsavounidis: figure 3) comprising: detecting a channel error by

locating a damaged macroblock in multiple macroblocks of a video frame using header information (Katsavounidis: column 8, lines 15-21); estimating the damaged macroblock by using undamaged macroblocks adjacent the damaged macroblock in the video frame (Katsavounidis: column 8, lines 40-50); and replacing the damaged macroblock with the estimated damaged macroblock to conceal the error in the damaged macroblock (Katsavounidis: column 9, lines 1-22), as in claim 26. However, Katsavounidis fails to implement the estimation step using all the macroblocks surrounding the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the step of estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53; column 4, lines 20-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment steps into the Katsavounidis method as implemented on a storage medium in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis method as implemented on a storage medium, now incorporating the Chien error concealment steps, has all of the features of claim 26.

Regarding claim 27, the Katsavounidis method as implemented on a storage medium, now incorporating the Chien error concealment steps, has wherein estimating the damaged macroblock using the undamaged macroblocks surrounding the damaged macroblock comprises: estimating the damaged macroblock by using a weighted linear interpolation of the undamaged

macroblocks surrounding the damaged macroblock (Chien: column 5, lines 20-45), as in the claim.

Regarding claim 28, Katsavounidis discloses wherein estimating the damaged macroblock using the undamaged macroblocks comprises: computing a pixel value for each pixel in the damaged macroblock as a function of associated pixels in the undamaged macroblocks surrounding the damaged macroblock (Chien: column 9, lines 40-60)), as in the claim.

Katsavounidis discloses a system (Katsavounidis: figure 1) comprising: a bus Katsavounidis: column 6, liens 35-41); a processor coupled to the bus (Katsavounidis: column 5, liens 50-55); a memory coupled to the processor (Katsavounidis: column 6, lines 15-20); a network interface coupled to the processor and the memory (Katsavounidis: column 6, lines 25-30); and a video decoder coupled to the network interface (Katsavounidis: column 6, lines 15-20) comprising: a header decoding module parses a video frame to get header information and multiple macroblocks (Katsavounidis: column 7, lines 5-15)); an error recovery module detects a channel error by locating a damaged macroblock in the multiple macroblocks using the header information (Katsavounidis: column 8, lines 15-20); and a spatial data error concealment module estimates the damaged macroblock by using undamaged macroblocks adjacent to a boundary of the damaged macroblock and replaces the damaged macroblock with the estimated damaged macroblock to conceal the channel error in the damaged macroblock (Katsavounidis: column 8,lines 40-60), as in claim 29. However, Katsavounidis fails to disclose an error concealment module using all the macroblocks substantially surrounding the damaged macroblock, as in the claim. Chien discloses a temporal spatial error concealment method including the step of

estimating the damaged macroblock by using undamaged macroblocks substantially surrounding a boundary of the damaged macroblock in the video frame (Chien: column 1, lines 25-53; column 4, lines 20-35) in order to account allow for an adaptive error concealment of error blocks containing a high degree of motion (Chien: column 4, lines 50-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the Chien error concealment module into the Katsavounidis system in order to implement error concealment on blocks exhibiting a high motion content. The Katsavounidis system, now incorporating the Chien error concealment module, has all of the features of claim 29.

Regarding claim 30, the Katsavounidis system, now incorporating the Chien error concealment module, discloses a bit stream demux module coupled to the header decoding module receives a coded video signal and obtains a sequence of video frames (Katsavounidis: column 8, lines 15-20), as in the claim.

Regarding claim 31, the he Katsavounidis system, now incorporating the Chien error concealment module, discloses wherein the spatial data error concealment module estimates the damaged macroblock by using a weighted linear interpolation of the undamaged macroblocks surrounding the damaged macroblock (Katsavounidis: column 8, lines 40-60), as in the claim.

### *Allowable Subject Matter*

7. Claims 9, 15, are directed towards allowable subject matter and would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office

action, and if further rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Dependent claims 9 and 15 recite a selection process of undamaged macroblocks for the error concealment process which is not met by the art of record. Accordingly, if the requirements for these claims are met, and if rejected claims 1, 3-8, 10-14, 16-1-31 are cancelled, the application would be placed in a condition for allowance.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy S. Rao whose telephone number is (571)-272-7337. The examiner can normally be reached on Monday-Friday 8 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571)-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andy S. Rao
Primary Examiner
Art Unit 2621

asr
/Andy S. Rao/
Primary Examiner, Art Unit 2621
December 19, 2008